STAAR ALGEBRA II REFERENCE MATERIALS

STAAR State of Texas Assessments of Academic Readiness

GENERAL FORMULAS

Slope of a line $m = \frac{y_2 - y_1}{x_2 - x_1}$

Law of Sines: $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$

Law of Cosines: $c^2 = a^2 + b^2 - 2ab\cos C$

Logarithmic Growth and Decay

$A = Pe^{rt}$ $\quad A = P\left(1 + \frac{r}{n}\right)^{nt}$

LOGARITHMS

Product	$\log_b(xy) = \log_b x + \log_b y$
Quotient	$\log_b\left(\frac{x}{y}\right) = \log_b x - \log_b y$
Power	$\log_b(x^r) = r\log_b x$

CONIC SECTIONS

General form	$Ax^2 + Bxy + Cy^2 + Dx + Ey + F = 0$	
Circle	$(x-h)^2 + (y-k)^2 = r^2$	
Parabola	$(x-h)^2 = 4p(y-k)$	$(y-k)^2 = 4p(x-h)$
Ellipse	$\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$	$\frac{(y-k)^2}{a^2} + \frac{(x-h)^2}{b^2} = 1$
Hyperbola	$\frac{(x-h)^2}{a^2} - \frac{(y-k)^2}{b^2} = 1$	$\frac{(y-k)^2}{a^2} - \frac{(x-h)^2}{b^2} = 1$

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FACTORING

Perfect square trinomials	$a^2 + 2ab + b^2 = (a + b)^2$ $a^2 - 2ab + b^2 = (a - b)^2$
Difference of squares	$a^2 - b^2 = (a - b)(a + b)$
Sum of cubes	$a^3 + b^3 = (a + b)(a^2 - ab + b^2)$
Difference of cubes	$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$

PROPERTIES OF EXPONENTS

Product of powers	$a^m a^n = a^{(m+n)}$
Quotient of powers	$\frac{a^m}{a^n} = a^{(m-n)}$
Power of a power	$(a^m)^n = a^{mn}$
Rational exponent	$a^{\frac{m}{n}} = \sqrt[n]{a^m}$
Negative exponent	$a^{-n} = \frac{1}{a^n}$

QUADRATIC EQUATIONS

Standard form	$f(x) = ax^2 + bx + c$
Vertex form	$f(x) = a(x - h)^2 + k$
Parabola	$(x - h)^2 = 4p(y - k)$ $(y - k)^2 = 4p(x - h)$
Quadratic formula	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
Axis of symmetry	$x = \frac{-b}{2a}$